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Forty-fourth Annual Report of the Savilian Professor of Astronomy to the Visitors of the University Observatory for 1918–19.

BOARD OF VISITORS, 1919.

THE VICE-CHANCELLOR (Herbert Edward Douglas Blakiston, D.D., President of Trinity).
THE SENIOR PROCTOR (J. F. Stenning, M.A., C.B., Fellow of Wadham).
THE JUNIOR PROCTOR (W. G. Kendrew, M.A., Non-Collegiate).
THE ASTRONOMER ROYAL (Sir Frank W. Dyson, M.A., LL.D., F.R.S.).
THE DIRECTOR OF THE CAMBRIDGE OBSERVATORY (Professor A. S. Eddington, M.A., M.Sc., F.R.S.).
THE RADCLIFFE OBSERVER (A. A. Rambaut, M.A., D.Sc., F.R.S.).
SIR W. H. M. CHRISTIE, K.C.B., Hon. D.Sc., F.R.S. } Until Nov. 10,
A. E. H. LOVE, D.Sc., F.R.S., Hon. Fellow of Queen's. } 1920.
E. B. ELLIOTT, M.A., F.R.S., Fellow of Magdalen. } Until Nov. 25,
C. LEUDESDORF, M.A., Fellow of Pembroke. } 1925.

The Report here presented refers to the period from April 26, 1918, to April 25, 1919, and exhibits the state of the Observatory on the last-named day.

I. Staff.

Mr. F. A. Bellamy has remained as First Assistant, entirely to my satisfaction. He took special pains, in the early months of this year, with trial photographs for the Eclipse expeditions.

Miss E. F. Bellamy was transferred to the Seismological Service, under the temporary and provisional arrangement sanctioned by the Board last year. She replaced Miss Caws at Shide (July 8 to August 16) to allow of Miss Caws having a holiday, and has taken charge of the Oxford Seismograph since its erection (by kind permission of Mr. J. Walker) in the basement of the Clarendon Laboratory in October last.

Dr. J. K. Fotheringham has been attached to the Observatory during the year by a special arrangement, sanctioned by the Board last year, and facilitated by a welcome grant of £50 from Magdalen College. The arrangement has in my opinion amply justified itself, and I shall ask the Board to consider a future development.

The office of caretaker and mechanic is still held over, pending the various consequences of demobilization.

It seems proper to mention here the early and sudden death of Mr. R. J. Pocock, B.Sc. (Queen's College), a former research student. He left early in 1914 to become the Director of the Nizamiah Observatory at Hyderabad (Deccan) which had undertaken a half-share in the Astrographic Catalogue, but had not so far accomplished anything essential. Under Mr. Pocock the Observatory quickly got to work, and in spite of serious difficulties due to the War completed and published two zones of the four undertaken, while making considerable progress with the other two. The achievement compares favourably with anything done elsewhere in connexion with this international enterprise. Mr. Pocock died from pneumonia, following on influenza, on October 9 last. The Nizam has granted a pension of £100 a year to his widow.

II. Teaching.

Mr. H. Macklin (Campion Hall) has been a research student since last October. Two students attended the ordinary lectures last Term.

Otherwise the educational work has consisted chiefly in lectures of a more or less popular character, for which there have been numerous demands, especially in military directions. The Director again visited France to give lectures under Y.M.C.A. auspices in November last (Nov. 12–26).

III. Research and Publications.

Volume IV ($+61°$) of the Vatican Zones has reached p. 60, and the printing promises to become a little more rapid. The measures of zone $+57°$ have been received from Rome and the determination of plate constants, &c. is now nearly completed for that zone.

In the Santiago zone ($-22°$) nineteen plates containing 14,597 stars have been measured and reduced, and about 20 more satisfactory plates are in hand; but though 60 more have been received, they are not sufficiently good to be worth measuring, and urgent letters have been written to Santiago to this effect. It will be disappointing if the project outlined last year fails in this way.

As regards the counts of different zones in the Astrographic Catalogue, eleven zones have been rectified and discussed, as will be seen in the list of papers below; and a good deal of other material is nearly ready for publication.

As regards meteorological statistics, the main investigation has only proceeded slowly; but two papers bearing on the subject have been published, one showing the connexion of the movements of the Earth's Pole with the "Chapters", the other confirming, from the Chinese Earthquake records of 2,000 years, the periodicity of 14·8 months inferred from the Catalogue of "Destructive Earthquakes" in the last few centuries.

The paper last mentioned is one result of the assignment of Miss Bellamy to the Seismological Service, which has rendered such investigations feasible. As already remarked, she has had the care of the Seismograph in the Clarendon basement, and on the occurrence of an earthquake, early information is interchanged with Shide, West Bromwich, Liverpool, Eskdalemuir and Aberdeen. Twenty earthquakes have been recorded in the six months since the installation.

The editing of Baxendell's Observations of Variable Stars, made in the middle of the last century, has been completed as the joint work of Miss M. A. Blagg and the Director. The greater part, and especially the laborious part, of the work has fallen to Miss Blagg, who was drawn into serious astronomical work by the University Extension (Oxford) lectures of the late J. A. Hardcastle. The Baxendell work is moreover by no means her first valuable contribution to Astronomy. One outcome of this careful discussion has been the abandonment of the suggested regular fluctuations of period: another has been to throw light on the nature of the classification of these variables, which, with valuable aid from the Rev. T. E. R. Phillips, seems to be taking satisfactory shape.

The following papers, by members of the Staff, have been published during the year :—

278. "*Nova* Ritchey." By Ethel F. Bellamy, *Observatory*, XLI, pp. 63 and 98.

279. "Obituary Notice of Dr. J. O. Backlund (1846–1916)." By H. H. Turner, *Proc. R. S.*, Series A, XCIV, p. xx.

280. "The Movements of the Earth's Pole. Note on Sir F. W. Dyson's Analysis." By H. H. Turner, *Mon. Not.*, LXXVIII, p. 462 (1918, May).

281. "Twelfth Note on the number of Faint Stars with Large Proper Motions, zone + 25°." By F. A. Bellamy, *Mon. Not.*, LXXVIII, p. 471 (1918, May).

282. "Baxendell's Observations of Variable Stars. Tenth Instalment: No. 25, U. Boötis; No. 26, U. Canis Minoris; No. 27, χ Cygni; No. 28, U. Herculis; No. 29, R. Scuti." Edited by H. H. Turner and Mary A. Blagg, *Mon. Not.*, LXXVIII, p. 491 (1918, May).

283. "Stellar Magnitude Scale of the Astrographic Catalogue. Twelfth Note: Hyderabad ($-17°$ and $-18°$), Perth ($-32°$ and $-34°$), Edinburgh ($-38°$), Cape ($-41°$ and $-42°$)." By H. H. Turner, *Mon. Not.*, LXXVIII, p. 578 (1918, June).

284. "Thirteenth Note on the Number of Faint Stars with Large Proper Motions, zone $+26°$ and $+27°$." By F. A. Bellamy, *Mon. Not.*, LXXVIII, p. 591 (1918, June).

285. "Note on the Nebulosity round *Nova* Persei." By H. H. Turner, *Mon. Not.*, LXXIX, p. 23 (1918, Nov.).

286. "Stellar Magnitude Scales of the Astrographic Catalogue. Thirteenth Note: Bordeaux ($+17° + 16° + 15°$ and $+14°$)." By H. H. Turner, *Mon. Not.*, LXXIX, p. 136 (1918, Dec.).

287. "Babylonian Measures and the δακτυλος." By J. K. Fotheringham, *Observatory*, XLII, p. 46 (1919, Jan.).

288. "New Star of Hipparchus and the dates of birth and accession of Mithridates." By J. K. Fotheringham, *Mon. Not.* LXXIX, p. 162 (1919, Jan.).

289. "On the Classification of Long Period Variable Stars. Third Paper: The Influence of Period on the shapes of the Curves in Phillips's two Groups." By H. H. Turner, *Mon. Not.*, LXXIX (1919, March).

290. "Seismological Investigations. Twenty-third Report for 1918." By H. H. Turner, *Brit. Assoc. Report* for 1918.

291. "On the fifteenth month periodicity in Earthquake phenomena." By H. H. Turner, *Mon. Not.*, LXXIX (1919, April).

IV. Buildings and Grounds.

A small wooden hut has been given to the Observatory by the Royal Air Force, and will be a valuable addition to our storage space. From the same source we have obtained also some asbestos boards, some corrugated iron sheets, and apparatus mentioned under § V.

The domes and outside window frames were painted in July and August: and the heating apparatus duly inspected.

V. Equipment, Library, &c.

On May 29 next there will be a total Eclipse of the Sun of unusual importance. The Astronomer Royal pointed out two years ago (*Mon. Not.*, R.A.S., Mar. 1917) that the Eclipse would afford a rare opportunity of testing Einstein's theory of gravitation—a revolutionary theory which has profoundly moved the mathematical and physical world. Two years ago there seemed little hope of making use of this opportunity; and a year ago, when it became necessary to face actual preparations for the Eclipse, there seemed even less. But in view of the fundamental importance of the issues at stake, and of the rarity of such an opportunity, the Eclipse Committee decided to proceed with the preparations for two expeditions as though the possibility of observing the Eclipse were assured; and as an essential item in the programme, I offered the loan of our Astrographic object-glass for one of the expeditions, the other being supplied by a similar loan from the Royal Observatory, Greenwich. At that time we had no special work for the object-glass here which could not profitably be deferred in view of the magnitude of this greater issue. Later, the entry of Mr. Macklin as a research student brought with it a call on the use of the telescope: but by taking full advantage of all opportunities, both the photographs required by Mr. Macklin and the trial and comparison photographs required for the Eclipse were all obtained. For the latter I have to thank the untiring and devoted work of Mr. Bellamy, who had to overcome special (War) difficulties.

The object-glass was dismounted on February 10, and I took it personally up to London next day, delivering it to the messengers sent to meet me by the Astronomer Royal. I may remind the Board that the object-glass was taken out by Mr. Bellamy and myself for the Eclipse of 1905 (Aswan, Egypt), and it was then insured for £500. The cost of replacement to-day would be at least double, and it has been insured for £1000. It left England under the care of Professor Eddington (one of the members of this Board) and Mr. Cottingham on March 7, for the Eclipse station, Prince's Island or Principe, in the Gulf of Guinea.

The wireless installation which had been removed by the Post Office authorities in August 1914 was set up again by them in February last, and has since been used, with occasional failures, for receiving daily time signals from the Eiffel Tower. Before its re-erection, we were kindly allowed by the R.A.F. to receive these signals (which are very useful in the Seismological Service) by means of their apparatus in the Zoological Laboratory.

In addition to the hut, &c. above mentioned, a pair of telephones (for wireless signals), a dark-room clock, an aerial compass, 2 voltmetres (3 v. and 12 v.), and some miscellaneous items have been presented to the Observatory by the R.A.F.

A number of unsuccessful astrographic negatives, of little astronomical value, were (at the suggestion of the Astronomer

Royal) supplied to the Ilford Company who were in need of the plate-glass for war purposes: the Company supplying us in return with some freshly-coated plates.

Clock Reid has been mounted in the Clarendon basement for use with the Seismograph.

A micrometer remains on loan for the measurement of Santiago plates.

The binding of books has been reduced to a minimum during the War.

Finally, I have to bring to the notice of the Board a substantial increase in the proposed legacy by the Rev. T. E. Espin, M.A., mentioned in the Report for 1914–15. As there stated Mr. Espin had "made provision in his Will that his new Reflecting Telescope, with an excellent 24-inch mirror by Calver, shall be bequeathed at his death to the University together with an annual salary of £150 to keep an assistant for it": and my suggestion then was that the telescope should ultimately replace our old De la Rue 13-inch. But Mr. Espin is so well satisfied with the performance of his telescope in its present position at Tow Law (co. Durham), that he now suggests leaving it *in situ*, and increasing the provision to £350 a year with the house attached: so that the University would be able to provide a succession of astronomical students with this generous opportunity for entering definitely upon an astronomical career. I can speak from experience of the value of such an opportunity; and I have little doubt of the attitude of the Board towards the proposed modification of the legacy.

H. H. TURNER.

UNIVERSITY OBSERVATORY,
OXFORD,
April 25, 1919.

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